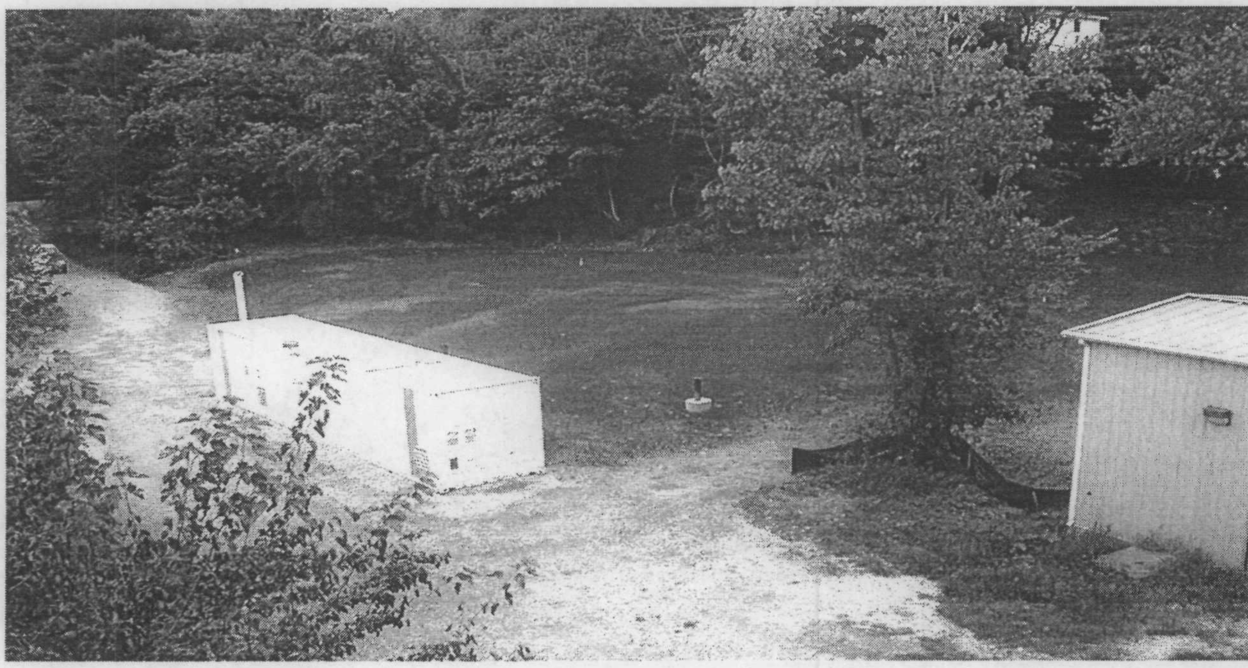
REMOVAL ACTION CONSTRUCTION COMPLETION REPORT

for the

TREATMENT OF IMPACTED SOILS

at the

GRANVILLE SOLVENTS SITE



PREPARED FOR

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REMOVAL ACTION CONSTRUCTION COMPLETION REPORT

for the

TREATMENT OF IMPACTED SOILS
June 25 – August 30, 2001

at the

Granville Solvents Site
300 Palmer Lane
Granville, Ohio

REVISION LOG		
Revision Number/Date	**Description of Changes**	**Pages Affected**
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Construction Completion Report
for
The Treatment of Impacted Soils
at the
Granville Solvents Site
Granville, Ohio

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Construction Completion Report
for
The Treatment of Impacted Soils
at the
Granville Solvents Site
Granville, Ohio

1 INTRODUCTION

In June 2001, Sharp and Associates, Inc. (SHARP) began site construction activities as a part of the Removal Action at the Granville Solvents Site including: site preparation; procurement of mechanical, electrical, drilling contractors and suppliers; demolition, transportation, and disposal of the warehouse, former still building and employee lounge; and installation of an air injection soil vapor extraction and air sparging system. The site is located at 300 Palmer Lane, on a 1.5-acre parcel in the Village of Granville, Ohio. A site map is shown as Figure 1. A photographic log of the project is also provided as Appendix A.

Construction activities were completed during the last week in August and startup of the system began the week of September 2, 2001.

The soil vapor extraction system and the air injection system are currently in operation. The air sparging system will be brought online during October 2001 pending effluent mass calculations to determine air emission rates.

2 PRE-MOBILIZATION

2.1 ASBESTOS SAMPLING/NESHAP NOTIFICATION

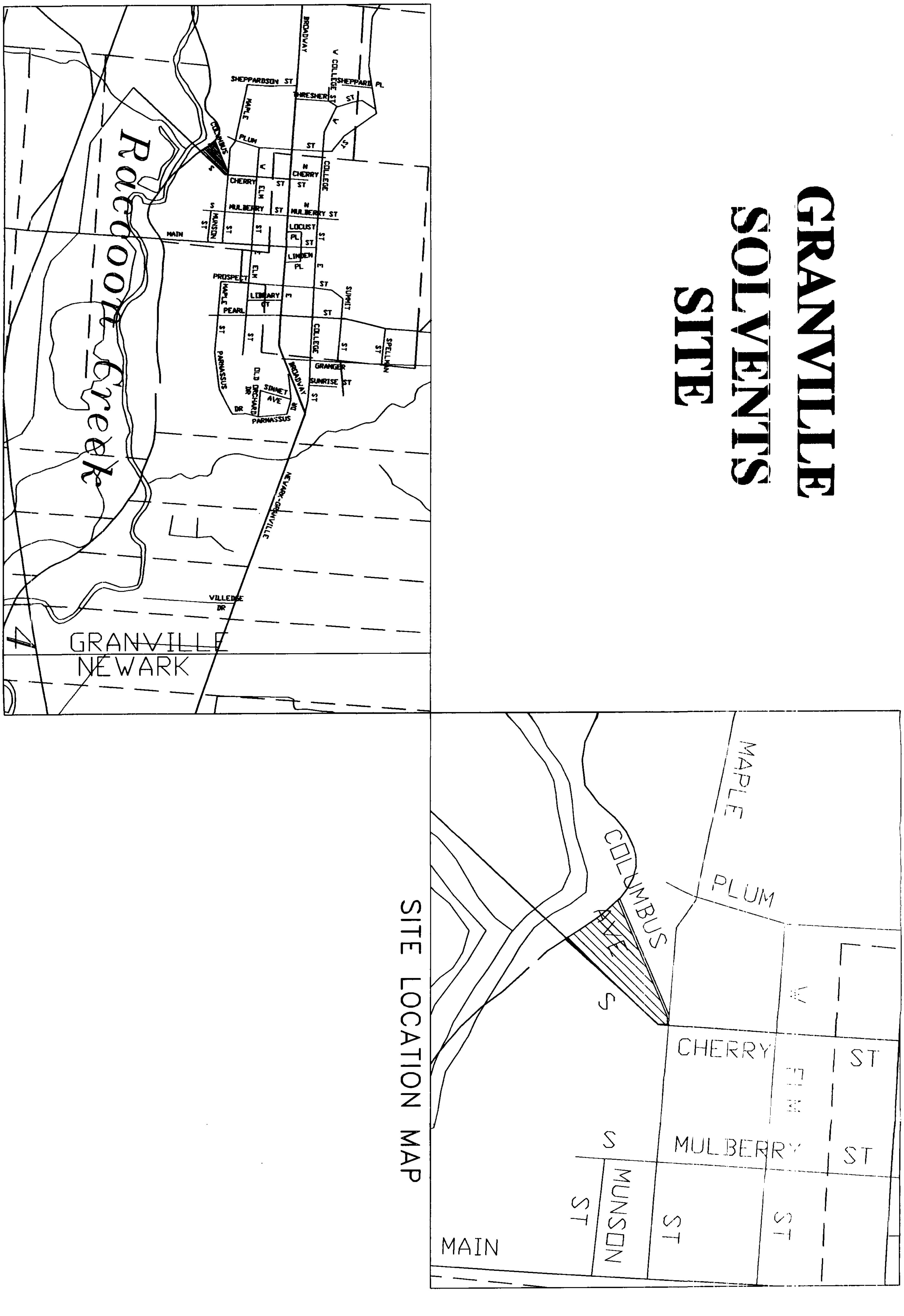
On June 25, 2001, a Certified Asbestos Hazard Evaluation Specialist inspected three site buildings. During the inspection, insulation, wallboard, roofing material, and floor tiles four materials were sampled to determine whether they contained asbestos. Table 1 summarizes the building location, material description and sample results. Appendix B contains the analytical results of all sampling that was conducted during pre-construction and construction activities at the site. These samples were required as part of the Ohio Environmental Protection Agency (OEPA) adopted Chapter 3745-20 of the Ohio Administrative Code (OAC) "Asbestos Emission Control from Renovation Demolition and Waste Disposal Operation". OAC 3745-20 implements the National Emission Standard for Hazardous Air Pollutants (NESHAP) Standard for Asbestos.

Samples were sent to Chryatech for analysis by polarized light microscopy. Three samples were collected of each material (the number of samples required is based on square footage of material). Verbal results were received from Chryatech on June 26, 2001. Of the materials sampled only the floor tile in the employee lounge contained asbestos.

The National Emission Standards for Asbestos (NESHAPS 40 CFR part 61 subpart M) have a small quantity cutoff of 160 ft^2. The quantity of tile flooring in the employee lounge containing asbestos was <160 ft^2. Therefore, the asbestos containing floor tile was removed without requiring a specialized asbestos removal contractor.

The NESHAP notification was sent to Ohio EPA on June 26, 2001. A copy of the NESHAP notification can be found in Appendix C.

GRANVILLE SOLVENTS SITE



SITE VICINITY MAP

SITE LOCATION MAP

FIGURE 1

SITE MAP

Project Reference: 1128-9
GRANVILLE SOLVENTS SITE
300 PALMER LANE
GRANVILLE, OHIO 43023

Client: GRANVILLE SOLVENTS SITE RESPONSE MANAGEMENT GROUP, L.L.C.

SHARP AND ASSOCIATES, INC.
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COLUMBUS, OHIO 43229
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TABLE 1
ASBESTOS SAMPLE RESULTS

Building	Material Description	Sample Number	Sample Result
Warehouse	Insulation – labeled as fiberglass, so no sampling required	NA	NA
Warehouse	Wallboard – material intact, age unknown	MB-1,2,3	Did not contain asbestos
Still building	Roofing material – visually classified as non-friable asbestos containing material (a)	NA	NA
Employee Lounge	Roofing material – visually classified as non-friable asbestos containing material (a)	NA	NA
Employee Lounge	Floor tile – non friable, but damaged	BR-1,2,3	Contains asbestos
Employee Lounge	Insulation – not labeled and therefore tested	BR-4,5,6	Did not contain asbestos
Employee Lounge	Wallboard – ¼" thick, dilapidated	BR-7,8,9	Did not contain asbestos

NA – Not applicable
a) material can be removed by general contractor so long as the removal does not use dust producing equipment (e.g., circular saw)

2.2 DEMOLITION AND BUILDING PERMITS

On June 25, 2001, SHARP submitted the Demolition Permit Application to the Village of Granville for the three structures to be demolished on the site. The Village of Granville, Planning and Zoning department approved the demolition permit on June 26, 2001. A copy of the demolition permit is provided as Appendix D.

Additionally the Village of Granville was contacted to inquire if the Village would require a zoning and architectural permit for the soil treatment system temporary building enclosure. The Village Planner indicated that he did not feel such a permit would be required under the circumstances, however, he requested a letter for the file indicating the use of the temporary enclosure. The Village Planner also indicated that the Village might require a zoning and architectural permit, which could be provided in a post construction theatre. The requested letter was forwarded to the Village on August 17, 2001.

On September 21, 2001 the Village of Granville requested that a building permit application be filed with the Village. The zoning and architectural application is currently being prepared. A copy of the requested letter and the zoning and architectural permit application is provided as Appendix E.

3 SITE PREPARATION

3.1 BUILDING FOUNDATION SAMPLING

On June 27, 2001 a composite sample of the foundation materials from all 3 buildings was collected (i.e. concrete, railroad ties, etc.) for waste disposal characteristics. Pace Analytical Services, Inc. in Indianapolis, Indiana analyzed the building foundation composite sample (sample ID: GVS-FC-1). The sample was analyzed for volatile organic compounds (VOCs), Toxic Characteristic Leaching Procedure (TCLP) for VOCs, TCLP for semivolatile organic compounds (SVOCs), and TCLP RCRA metals. Table 2 below summarizes the building foundation analytical results.

TABLE 2
BUILDING FOUNDATIONS COMPOSITE SAMPLE ANALYTICAL RESULTS

Sample ID	Parameter	Result	Laboratory Reporting Limit	Units
GVS-FC-1	Barium (TCLP)	0.316	0.100	mg/l
GVS-FC-1	1,1-Dichloroethene (VOCs per 8260)	33	5.0	ug/kg
GVS-FC-1	1,2,4-Trimethylbenzene (VOCs per 8260)	26	5.0	ug/kg

*only detections were recorded in this table.

3.2 SITE SURVEYING

Smart Engineering & Surveying, Inc. (SMART), of Newark, Ohio performed all site surveying activities. On July 6 and July 9, 2001, the surveyor was on-site to determine the coordinates of all building corners, monitoring and extraction wells, vapor monitoring points, fence corners and other site features. Locations were provided using State Plane coordinates and elevations using the closest United States Coast & Geodetic Survey marker. This information was used to prepare a basic map of the site.

On July 22, 2001,after the completion of demolition and grading, the surveyor laid out the plan locations for the air injection, air sparging, and vapor extraction wells prior to the commencement of the site drilling activities.

3.3 MOWING

On July 9, 2001 the site was mowed using a skid steer with a mower attachment. The site was mowed to allow access to work areas used for site activities such as; equipment staging, material storage, field office trailer, and toilet facilities. During the mowing phase of operations a hand held weed whip was also utilized in areas that were not accessible with the skid steer mounted mower deck.

3.4 CLEARING AND GRUBBING

Clearing and grubbing activities took place throughout the construction phase of the project. Trees were removed only on an as-needed basis. The methods used varied from using a tracked loader to using chain saws. The cleared vegetative debris was staged in an area away from on-going site activities.

3.5 DRIVEWAY UPGRADE

On July 9, 2001, 40.5 tons of limestone base material (Ohio Department of Transportation Specification 304) was delivered to the site to build up the driveway leading from Palmer Drive to the site. The limestone was placed over the existing drive using a skid steer. The road was improved to provide better access for site trucks, drilling rigs, and waste disposal trucks which would be entering and exiting the site on a semi-regular basis throughout the duration of the project.

3.6 ABANDONMENT OF PILOT TEST WELLS

Twelve Soil Vapor Extraction (SVE) pilot test wells were abandoned on July 11, 2001and 2 additional SVE pilot test wells were abandoned on August 21, 2001. The wells were abandoned utilizing a skid steer, a tow strap, Bentonite chips, and water. The wells were pulled out of the ground incrementally and at each interval Bentonite chips were poured into well. This process was repeated until the entire well casing was removed from the ground and the hole filled with Bentonite chips. The chips were then hydrated with water. Three wells could not be removed completely due to the plastic well casing breaking off during removal. At those locations the bottoms of the wells were knocked out using a metal rod, the hole was then filled with Bentonite chips and hydrated with water.

4 BUILDING DEMOLITION

4.1 WAREHOUSE DEBRIS, EQUIPMENT AND DRUM REMOVAL

Removal of miscellaneous metal equipment and steel drums from the warehouse building began on July 9, 2001 and continued through July 13, 2001. The 55-gallons steel drums were opened, emptied and crushed. All metal and steel materials were loaded into a metal recycling roll-off provided by Masser Metals, Columbus, Ohio. These materials were transported off-site for metal recycling at Masser Metals.

4.2 BUILDING DEMOLITION

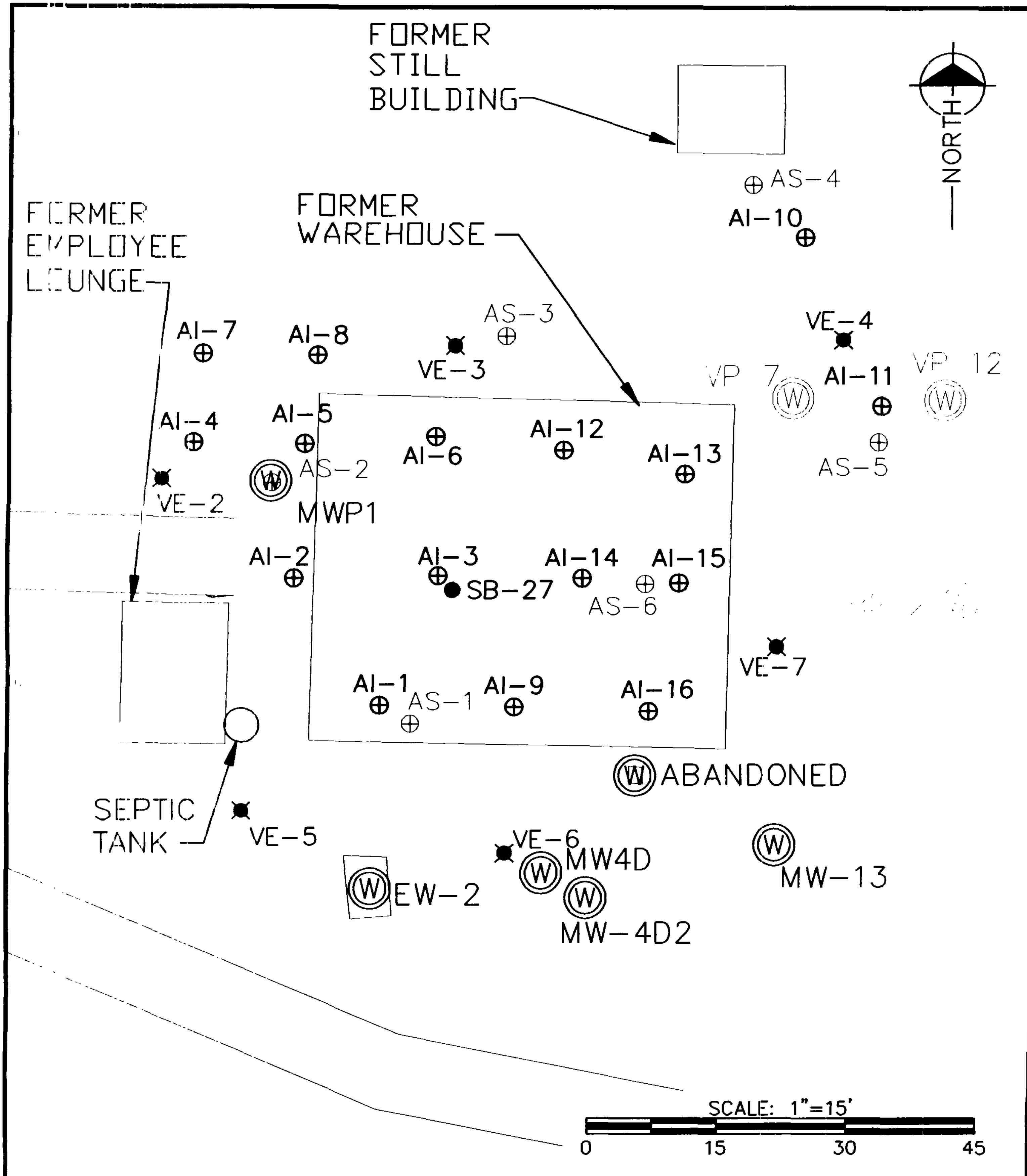
4.2.1 Employee Lounge

Demolition activities began on July 13, 2001. The first building demolished was the employee lounge. The demolished lounge building materials were segregated into two piles; construction and demolition debris (above-grade building material), and Subtitle D landfill debris (foundation material at or below grade) respectively.

Once the employee lounge was demolished, and the debris segregated, a concrete walkway between the former employee lounge and the warehouse was removed. Upon the removal of this concrete, a sanitary septic tank was discovered. The septic tank was located approximately 5 feet east of where the employee lounge once stood, and approximately 10 feet north of vapor extraction well VE-5. The septic tank was approximately 48 inches in diameter and approximately 5-1/2 feet deep. The septic tank contained approximately 4 feet of liquid and sludge. There were no obvious signs of piping runs leading away from the septic tank to a discharge point. The only piping discovered were two sections of clay tile, one 12 inch section to the west and one section to the east. Both sections of pipe were leading either into or out of the pre-cast holes on the east and west sides of the septic tank. Figure 2 depicts the location of the septic tank found during the demolition of the employee lounge and walkway.

A sample of the septic tank contents was collected on July 16, 2001 for waste disposal characteristics. The sample was analyzed for VOCs (8260), TCLP VOCs, TCLP SVOCs, TCLP RCRA metals, flashpoint, pH, and total VOCs. The laboratory analytical results of this sample included the detection of chlorinated solvents, benzene, xylenes, and six RCRA metals. Compounds detected at various concentrations are listed in Table 3.

On August 2, 2001 Chris Hill of the Licking County Health Department verified that notification of abandonment or removal of septic systems is not required.



SHARP AND ASSOCIATES, INC.

GRANVILLE SOLVENTS SITE
SEPTIC TANK LOCATION

PROJECT NUMBER	DATE	FILE NAME	SCALE
1128	9/27/01	1128-T3	1"=15'

FIGURE 2

TABLE 3
SEPTIC TANK CONTENTS SAMPLE RESULTS

Sample ID	Parameter	Date	Result	Laboratory Reporting Limit	Units
Septic Tank	Vinyl Chloride	7/16/01	1600	1100	ug/kg
Septic Tank	Trichloroethene	7/16/01	320 J	570	ug/kg
Septic Tank	Tetrachloroethene	7/16/01	800	570	ug/kg
Septic Tank	Ethylbenzene	7/16/01	110 J	570	ug/kg
Septic Tank	Xylenes (total)	7/16/01	610	570	ug/kg
Septic Tank	Benzene	7/16/01	0.0014 U	0.025	mg/L
Septic Tank	Tetrachloroethylene	7/16/01	0.019 J	0.070	mg/L
Septic Tank	Trichloroethylene	7/16/01	0.016 J	0.050	mg/L
Septic Tank	Vinyl Chloride	7/16/01	0.060	0.050	mg/L
Septic Tank	Arsenic	7/16/01	0.0057 U	0.50	mg/L
Septic Tank	Barium	7/16/01	0.27 B	10.0	mg/L
Septic Tank	Cadmium	7/16/01	0.00050 U	0.10	mg/L
Septic Tank	Chromium	7/16/01	0.0031 U	0.50	mg/L
Septic Tank	Lead	7/16/01	0.083 U	0.50	mg/L
Septic Tank	Selenium	7/16/01	0.0047 U	0.25	mg/L
Septic Tank	pH	7/16/01	7.9	--	S.U.
Septic Tank	Flashpoint	7/16/01	>180°F	--	deg F

J = Estimated result. Result is less than the reporting limit

B = Method blank contamination. The associated method blank contains the target analyte at a reportable level.

U = Results considered non-detect at concentration reported due to method blank contamination

4.2.2 Warehouse Building

American Electric Power (AEP) was contacted on July 12, 2001 to disconnect the electrical wires leading from the power pole on Palmer Lane to the warehouse building. AEP disconnected the electrical wires on July 12, 2001.

Demolition of the 2,000 square feet warehouse building began on July 13, and was completed on July 14, 2001. The debris from the warehouse building was segregated into three locations. One stockpile consisted of above grade construction and demolition debris, and the other stockpile consisted of at and below grade demolition debris (included concrete and railroad ties, etc.) for the disposal at a Subtitle D landfill. The third location for debris from the warehouse building was a metal recycling roll-off. A majority of the building material consisted of foundation materials and metals available for recycling.

While removing the northwest warehouse footing an odor was detected and monitored with a Photo Ionization Detector (PID). A reading of 102 ppm was detected in the breathing zone and steadily decreased with time to 0.0 ppm. This area was located 20.5 feet to the northeast of MW P-1 and 43 feet 8 inches to the west of VP-7.

During the removal of the warehouse concrete floor two "catch basin" like structures were removed. One catch basin was located on the east side of the warehouse and one on the west side. The catch basin to the west, when removed, revealed a pea gravel base unlike the concrete floor, which had a compacted soil base. A sample of the pea gravel was collected and analyzed by Severn Trent Laboratories Inc., North Canton, Ohio, for VOCs (8260). Analytical data for those samples collected from the West Sump with detectable concentrations of contaminants are listed in Table 4.

TABLE 4
WEST SUMP SOIL SAMPLE RESULTS

Sample ID	Parameter	Date	Result	Laboratory Reporting Limit	Units
West Sump	1,1-Dichloroethane	7/14/01	8.2	14	ug/kg
West Sump	1,2-Dichloroethene (total)	7/14/01	90	14	ug/kg
West Sump	1,1,1-Trichloroethance	7/14/01	62	14	ug/kg
West Sump	Trichloroethene	7/14/01	130	14	ug/kg
West Sump	Tetrachloroethene	7/14/01	330	14	ug/kg

When the catch basin located in the eastern portion of the warehouse floor was removed, an 8-12 inch "hole" with an undetermined depth was observed. The "hole" contained free liquids and PID readings of 0.0 ppm were recorded at the level of the free liquid. The catch basin was removed and visually inspected. The catch basin showed no visible signs of piping running from the bottom of the structure, however, it was noted that the thickness of the catch basin base was not as thick as the other portion of the structure. A small line (~3/4 to 1 inch in diameter) ran approximately 3.5 feet below grade northeast to southwest next to the catch basin. The line was not connected through the catch basin, but was in two sections. Soil and liquid samples were collected from the east sump and were analyzed for VOCs (8260). Compounds detected at measurable levels are listed in Table 5.

TABLE 5
EAST SUMP LIQUID AND SOIL SAMPLE RESULTS

Sample ID	Parameter	Date	Result	Laboratory Reporting Limit	Units
East Sump Liquid	Acetone	7/16/01	3.3 J	25	ug/L
East Sump Liquid	1,1-Dichloroethane	7/16/01	20	2.5	ug/L
East Sump Liquid	1,2-Dichlotoethene (total)	7/16/01	61	2.5	ug/L
East Sump Liquid	1,1,1-Trichloroethane	7/16/01	6.3	2.5	ug/L
East Sump Liquid	Trichloroethene	7/16/01	1.9 J	2.5	ug/L
East Sump Liquid	Tetrachloroethene	7/16/01	9.6	2.5	ug/L
East Sump Soil	1,1,1-Trichloroethane	7/16/01	2.3 J	6.1	ug/kg
East Sump Soil	Tetrachloroethene	7/16/01	16	6.1	ug/kg

J = Estimated result. Result is less than the reporting limit

4.2.3 Former Still Building

The former still building was demolished on July 16, 2001. The building debris was segregated into two stockpiles; construction and demolition debris for above grade material, and a Subtitle D landfill stockpile for at or below grade material.

5 DEBRIS DISPOSAL AND RECYCLING

5.1 METALS RECYCLING

All metals that were stored inside the warehouse and a majority of the metals from the warehouse structure were sent to Masser Metals in Columbus, Ohio for recycling. Three roll-offs, listed in Table 6, were sent to Masser Metals. Copies of all Bills of Lading, Non-Hazardous Waste, and Hazardous Waste Manifests are provided as Appendix F.

TABLE 6
METAL RECYCLING

Load Number	Date	Trucking Company	Recycling Facility
1	7/13/01	Masser Metals	Masser Metals, Columbus, Ohio
2	7/16/01	Masser Metals	Masser Metals, Columbus, Ohio
3	7/18/01	Masser Metals	Masser Metals, Columbus, Ohio

5.2 CONSTRUCTION AND DEMOLITION DEBRIS

Building debris from above grade, from all three buildings, was staged into a common construction and demolition debris stockpile and transported to Roberts Landfill, Newark, Ohio via tractor-trailer. Three loads of construction and demolition debris were removed from the site. Table 7 lists the construction and demolition debris disposal.

TABLE 7
CONSTRUCTION AND DEMOLITION DEBRIS

Manifest Number	Date	Trucking Company	Disposal Facility
11281	7/16/01	Berner Trucking	Roberts Landfill, Newark, Ohio
11282	7/16/01	Berner Trucking	Roberts Landfill, Newark, Ohio
11283	7/16/01	Berner Trucking	Roberts Landfill, Newark, Ohio

5.3 SUBTITLE D LANDFILL DEBRIS

A composite sample of the foundation materials from all three buildings (i.e. concrete, railroad ties, etc.) was collected on June 27, 2001 for waste disposal characteristics. Pace Analytical Services, Inc. in Indianapolis, Indiana analyzed the building foundation composite sample. Laboratory analytical results from this sample detected barium (TCLP), 1,1-Dichloroethene (VOCs per 8260), and 1,2,4-Trimethylbenzene (VOCs per 8260). Since none of the debris and materials associated with the building foundations that were in contact with soils was hazardous, they were disposed of at Republic Services, Inc. in Amanda, Ohio. As seen in Table 8, five loads of material were disposed of at Republic Services.

TABLE 8
SUBTITLE D LANDFILL DEBRIS

Manifest Number	Date	Trucking Company	Disposal Facility
11281	7/19/01	Berner Trucking	Republic Services, Inc., Amanda, Ohio
11282	7/19/01	Berner Trucking	Republic Services, Inc., Amanda, Ohio
11283	7/19/01	Berner Trucking	Republic Services, Inc., Amanda, Ohio
11284	7/19/01	Berner Trucking	Republic Services, Inc., Amanda, Ohio
11285	7/19/01	Berner Trucking	Republic Services, Inc., Amanda, Ohio

5.4 HAZARDOUS WASTE DISPOSAL

One load of hazardous waste was transported to The Environmental Quality Company (EQ) in Belleville, Michigan on August 28, 2001. The hazardous waste shipment, listed in Table 9, contained the septic tank and contents, four empty crushed drums used for drilling decontamination waters, plastic well casings and screens from vapor point removals, and one metal filter housing with a sand material.

A composite sample collected from the filter housing sand was non-hazardous and could have been disposed of at a Subtitle D landfill. However a cost analysis indicated that it was less expensive to ship this material to EQ rather than arrange another shipment to the Subtitle D landfill. Analytical results for the composite material are presented in Table 10.

TABLE 9
HAZARDOUS WASTE SHIPMENT

Manifest Number	Date	Trucking Company	Disposal Facility
33433	8/28/01	Berner Trucking	The Environmental Quality Company, Belleville, Michigan

TABLE 10
COMPOSITE FILTER HOUSING MATERIAL FROM THE WAREHOUSE BUILDING

Sample ID	Parameter	Date	Result	Laboratory Reporting Limit	Units
Misc. Debris/Filter Housing	Acetone	7/16/01	8.7 J	23	ug/kg
Misc. Debris/Filter Housing	Styrene	7/16/01	1.5 J	5.8	ug/kg
Misc. Debris/Filter Housing	Barium	7/16/01	0.31 B	10.0	mg/L
Misc. Debris/Filter Housing	Cadmium	7/16/01	0.0065 B	0.10	mg/L
Misc. Debris/Filter Housing	Chromium	7/16/01	0.0040 U	0.50	mg/L
Misc. Debris/Filter Housing	Lead	7/16/01	0.011 U	0.50	mg/L
Misc. Debris/Filter Housing	Selenium	7/16/01	0.0088 U	0.25	mg/L

J = Estimated result. Result is less than the reporting limit
B = Method blank contamination. The associated method blank contains the target analyte at a reportable level.
U = Results considered non-detect at concentration reported due to method blank contamination

6 SITE GRADING

The site was graded on July 17, 2001. Approximately 2 feet of soils were removed from the area northeast of the warehouse building and stockpiled on site behind the existing groundwater treatment building. *The Engineering Evaluation/Cost Analysis* (M&E, 1999) contained data showing that the concentrations of contaminants of concern in soils in this area were below the risk-based soil treatment goals as listed in the *Air Injection/Soil Vapor Extraction/Air Sparging Design Report* (M&E, February 2001). The site was graded to ensure that surface water would not pond. Silt fencing was installed on the down gradient areas of the site where the potential for runoff was present.

7 DRILLING OPERATIONS

Drilling operations commenced as scheduled on July 24, 2001. Bucksar Environmental Drilling Co., Canton, Ohio installed sixteen air injection, six air sparging, and six vapor extraction wells. The borings were advanced using 4 ¼-inch hollow stem augers.

Wells were installed in borings advanced with 4-¼ inch I.D. hollow stem auger (HSA). Completion depths were determined in the field based on lithology encountered. Once the final completion depths were determined, approximately 2-feet of 3/8-inch bentonite chips were placed in the bottom of the boring and hydrated with potable water. All wells were constructed with schedule 40 PVC with a 5-foot (nominal) 0.020 slot screen and non-threaded slip caps at the base. Air injection wells are 2-inches in diameter while the air sparging and soil vapor extraction wells are 1-inch in diameter. The annular space was filled with #4 silica sand pack to 6 inches above the top of the slot screen. Six inches of choke sand was placed above the sand pack. The remaining annular space was filled with 3/8 inch hydrated bentonite chips. The PVC riser was cut 2-feet above ground surface and secured with a slit cap.

Screen modifications were made to the air injection wells based on the thickness of the clay layer encountered during drilling. The thin clay layer in some areas resulted in the installation of well screens less than the plan-specified 5 feet in eleven of the sixteen wells. Refer to Section 11.5 for details regarding this change.

Drilling operations were completed on August 2, 2001. Table 11 summarizes well installation and construction details.

TABLE 11
WELL CONSTRUCTION DETAIL

Well ID	Bottom of Boring (feet)	Sand/Clay Interface (feet)	Bottom of Screen (feet)	Top of Screen (feet)	Screen Length (feet)	Top of filter Pack (feet)	Top of Choke Sand (feet)	Top of Bentonite Plug (feet)
AI-1	11	8	6.5	2.5	4	2	1.5	0
AI-2	11	7.5	5.5	2.5	3	2	1.5	0
AI-3	9	7.4	5.5	2.5	3	2.5	2	0
AI-4	9	7	5	3	2	2.5	2	0
AI-5	11	10.5	8.5	3.5	5	3	2.5	0
AI-6	11	10.5	9	4	5	3.5	3	0
AI-7	9	8.6	7	3	4	2.5	2	0
AI-8	9	7	5	3	2	2.5	2	0
AI-9	7	5	3	2	1	2	1.5	0
AI-10	11	10	8	3	5	2.5	2	0
AI-11	11	12	10	5	5	4.5	4	0
AI-12	7	6	4	2	2	2	1.5	0
AI-13	11	9	8	3	5	2.5	2	0
AI-14	11	5	3	2	1	2	1.5	0
AI-15	11	9	7	3	4	2.5	2	0
AI-16	11	10.5	10	5	5	4.5	4	0
[illegible]								
VE-2	24	~12	22	12	10	11	--	0
VE-3	25	~11	23	13	10	12	--	0
VE-4	22	~12	18.5	8.5	10	7.5	--	0
VE-5	25	~4	23	13	10	12	--	0
VE-6	21	~12	18	8	10	7	--	0
VE-7	27	12	22	12	10	11	--	0
[illegible]								
AS-1	39	~6	38	36	2	35	--	32
AS-2	50	8.5	47	45	2	40	--	35
AS-3	47	~11	44.5	42.5	2	39	--	36
AS-4	46	~9	45	43	2	42	--	38
AS-5	50		44	42	2	41	--	35.4
AS-6	50	~9	46	44	2	43	--	40

7.1 SAMPLE COLLECTION DURING DRILLING ACTIVITIES

Soil samples were collected during drilling for laboratory analysis and for field screening verification using a PID. The sample which exhibited the highest PID reading in each well was submitted to the laboratory for analysis. Laboratory results (detections only) are summarized in Table 12. All samples collected during the drilling operations were sent to Severn Trent Laboratories, Inc., North Canton, Ohio for analysis.

Vapor extraction wells VE-7 and VE-5 had detections above the risk-based soil treatment goals for tetrachloroethene and trichloroethene respectively. Air injection well AI-11 had a detection of tetrachloroethene just above the risk-based soil treatment goal. Tetrachloroethene was detected above the risk-based soil treatment goals in air sparging wells, AS-3, AS-4, AS-5, and AS-6. No other wells had detections of contaminants of concern above the risk-based soil treatment goals.

TABLE 12
ANALYTICAL RESULTS FROM WELL DRILLING ACTIVITIES

Sample ID	Sample Depth	Parameter	Date	Result	Reporting Limit	Units
VE-7, 16'-18'	16'-18'	Tetrachloroethene	7/24/01	31000	280	ug/kg
VE-7, 16'-18'	16'-18'	Trichloroethene	7/24/01	340	280	ug/kg
VE-4, 20'-22'	20'-22'	Tetrachloroethene	7/24/01	4700	270	ug/kg
VE-4, 20'-22'	20'-22'	Trichloroethene	7/24/01	380	270	ug/kg
VE-6, 19'-21'	19'-21'	Tetrachloroethene	7/25/01	3000	280	ug/kg
VE-6, 19'-21'	19'-21'	Trichloroethene	7/25/01	2400	280	ug/kg
VE-5, 17'-19'	17'-19'	1,1,1-Trichloroethane	7/25/01	17000	270	ug/kg
VE-5, 17'-19'	17'-19'	Trichloroethene	7/25/01	14000	270	ug/kg
VE-2, 22'-24'	22'-24'	Tetrachloroethene	7/25/01	2800	270	ug/kg
VE-2, 22'-24'	22'-24'	1,1,1-Trichloroethane	7/25/01	480	270	ug/kg
VE-2, 22'-24'	22'-24'	Trichloroethene	7/25/01	3500	270	ug/kg
VE-3, 23'-25'	23'-25'	Tetrachloroethene	7/27/01	4300	260	ug/kg
VE-3, 23'-25'	23'-25'	1,1,1-Trichloroethane	7/27/01	360	260	ug/kg
VE-3, 23'-25'	23'-25'	Trichloroethene	7/27/01	1200	260	ug/kg
AI-16, 9'-11'	9'-11'	Methylene chloride	7/24/01	2.5 U	5.5	ug/kg
AI-16, 9'-11'	9'-11'	Trichloroethene	7/24/01	5.2 J	5.5	ug/kg
AI-16, 9'-11'	9'-11'	Tetrachloroethene	7/24/01	210	5.5	ug/kg
AI-16, 9'-11'	9'-11'	Toluene	7/24/01	0.73 J	5.5	ug/kg
AI-9, 7'-9'	7'-9'	Methylene chloride	7/24/01	2.7 U	5.5	ug/kg
AI-9, 7'-9'	7'-9'	1,1,1-Trichloroethane	7/24/01	4.4 J	5.5	ug/kg
AI-9, 7'-9'	7'-9'	Trichloroethene	7/24/01	46	5.5	ug/kg
AI-9, 7'-9'	7'-9'	Tetrachloroethene	7/24/01	100	5.5	ug/kg
AI-13, 5'-7'	5'-7'	1,1-Dichloroethane	7/24/01	71	20	ug/kg
AI-13, 5'-7'	5'-7'	1,2-Dichloroethene (total)	7/24/01	71	20	ug/kg
AI-13, 5'-7'	5'-7'	1,1,1-Trichloroethane	7/24/01	240	20	ug/kg
AI-13, 5'-7'	5'-7'	Trichloroethene	7/24/01	130	20	ug/kg
AI-13, 5'-7'	5'-7'	Tetrachloroethene	7/24/01	630	20	ug/kg

TABLE 12
ANALYTICAL RESULTS FROM WELL DRILLING ACTIVITIES (CONTINUED)

Sample ID	Sample Depth	Parameter	Date	Result	Reporting Limit	Units
AI-12, 5'-7'	5'-7'	Methylene chloride	7/24/01	3.2 U	6.2	ug/kg
AI-12, 5'-7'	5'-7'	1,1,1-Trichloroethane	7/24/01	9.0	6.2	ug/kg
AI-12, 5'-7'	5'-7'	Trichloroethene	7/24/01	65	6.2	ug/kg
AI-12, 5'-7'	5'-7'	Tetrachloroethene	7/24/01	200	6.2	ug/kg
AI-8, 5'-7'	5'-7'	Tetrachloroethene	7/30/01	120	12	ug/kg
AI-8, 5'-7'	5'-7'	1,1,1-Trichloroethane	7/30/01	16	12	ug/kg
AI-8, 5'-7'	5'-7'	Trichloroethene	7/30/01	36	12	ug/kg
AI-7, 7'9'	7'-9'	Tetrachloroethene	7/30/01	38	11	ug/kg
AI-7, 7'9'	7'-9'	1,1,1-Trichloroethane	7/30/01	11	11	ug/kg
AI-7, 7'9'	7'-9'	Trichloroethene	7/30/01	26	11	ug/kg
AI-7, 7'9'	7'-9'	1,2,4-Trimethylbenzene	7/30/01	33*I	11	ug/kg
AI-7, 7'9'	7'-9'	1,3,5-Trimethylbenzene	7/30/01	15*I	11	ug/kg
AI-6, 3'-5'	3'-5'	Benzene	7/30/01	160 J	740	ug/kg
AI-6, 3'-5'	3'-5'	1,1-Dichloroethene	7/30/01	71 J	740	ug/kg
AI-6, 3'-5'	3'-5'	1,2-Dichloroethene (total)	7/30/01	560 J	740	ug/kg
AI-6, 3'-5'	3'-5'	Ethylbenzene	7/30/01	130 J	740	ug/kg
AI-6, 3'-5'	3'-5'	Tetrachloroethene	7/30/01	4800	740	ug/kg
AI-6, 3'-5'	3'-5'	Toluene	7/30/01	3000	740	ug/kg
AI-6, 3'-5'	3'-5'	1,1,1-Trichloroethane	7/30/01	8400	740	ug/kg
AI-6, 3'-5'	3'-5'	1,1,2-Trichloroethane	7/30/01	92 J	740	ug/kg
AI-6, 3'-5'	3'-5'	Trichloroethene	7/30/01	16000 B	740	ug/kg
AI-6, 3'-5'	3'-5'	Xylenes (total)	7/30/01	1400	740	ug/kg
AI-5, 9'-11'	9'-11'	Tetrachloroethene	7/30/01	1800	280	ug/kg
AI-5, 9'-11'	9'-11'	Trichloroethene	7/30/01	3400	280	ug/kg
AI-4, 5'-7'	5'-7'	Tetrachloroethene	7/30/01	22	1.2	ug/kg
AI-4, 5'-7'	5'-7'	1,1,1-Trichloroethane	7/30/01	1.3	1.2	ug/kg
AI-4, 5'-7'	5'-7'	Trichloroethene	7/30/01	37	1.2	ug/kg
*AI-14, 5'-7'	5'-7'	1,2-Dichloroethane	7/30/01	39 U	720	ug/kg
*AI-14, 5'-7'	5'-7'	Tetrachloroethene	7/30/01	3000	720	ug/kg
*AI-14, 5'-7'	5'-7'	Trichloroethene	7/30/01	130 U	720	ug/kg
AI-14, 3'-5'	3'-5'	Trichloroethene	7/31/01	7.9	5.8	ug/kg
AI-14, 3'-5'	3'-5'	Tetrachloroethene	7/31/01	48	5.8	ug/kg
AI-10, 7'-9'	7'-9'	Tetrachloroethene	7/31/01	1400	62	ug/kg
AI-10, 7'-9'	7'-9'	Trichloroethene	7/31/01	150	62	ug/kg
AI-11, 9'-11'	9'-11'	Tetrachloroethene	7/31/01	5600	120	ug/kg
AI-11, 9'-11'	9'-11'	1,1,1-Trichloroethane	7/31/01	140	120	ug/kg
AI-11, 9'-11'	9'-11'	Trichloroethene	7/31/01	310	120	ug/kg
AI-1, 5'-7'	5'-7'	Trichloroethene	8/01/01	17	5.6	ug/kg
AI-1, 5'-7'	5'-7'	Tetrachloroethene	8/01/01	32	5.6	ug/kg

*Mislabeled on chain of custody and on laboratory analytical results – these data are for AI-15

TABLE 12
ANALYTICAL RESULTS FROM WELL DRILLING ACTIVITIES (CONTINUED)

Sample ID	Sample Depth	Parameter	Date	Result	Reporting Limit	Units
AI-3, 7'-9'	7'-9'	1,2-Dichloroethene (total)	8/01/01	5.7 J	12	ug/kg
AI-3, 7'-9'	7'-9'	1,1,1-Trichloroethane	8/01/01	24	12	ug/kg
AI-3, 7'-9'	7'-9'	Trichloroethene	8/01/01	89	12	ug/kg
AI-3, 7'-9'	7'-9'	Tetrachloroethene	8/01/01	140	12	ug/kg
AI-3, 7'-9'	7'-9'	Ethylbenzene	8/01/01	1.6 J	12	ug/kg
AI-3, 7'-9'	7'-9'	Xylenes (total)	8/01/01	8.6 J	12	ug/kg
AI-2, 7'-9'	7'-9'	Tetrachloroethene	8/01/01	63	1.2	ug/kg
AI-2, 7'-9'	7'-9'	1,1,1-Trichloroethane	8/01/01	2.0	1.2	ug/kg
AI-2, 7'-9'	7'-9'	Trichloroethene	8/01/01	58	1.2	ug/kg
AS-1, 18'-20'	18'-20'	Methylene chloride	7/25/01	550	28	ug/kg
AS-1, 18'-20'	18'-20'	1,1-Dichloroethane	7/25/01	200	28	ug/kg
AS-1, 18'-20'	18'-20'	1,2-Dichloroethene (total)	7/25/01	190	28	ug/kg
AS-1, 18'-20'	18'-20'	1,1,1-Trichloroethance	7/25/01	14 J	28	ug/kg
AS-1, 18'-20'	18'-20'	Trichloroethene	7/25/01	180	28	ug/kg
AS-1, 18'-20'	18'-20'	Tetrachloroethene	7/25/01	16 J	28	ug/kg
AS-4, 25'-27'	25'-27'	Tetrachloroethene	7/25/01	14000	270	ug/kg
AS-4, 25'-27'	25'-27'	1,1,1-Trichloroethane	7/25/01	690	270	ug/kg
AS-4, 25'-27'	25'-27'	Trichloroethene	7/25/01	2700	270	ug/kg
AS-3, 21'-23'	21'-23'	Tetrachloroethene	7/27/01	6400	260	ug/kg
AS-3, 21'-23'	21'-23'	Trichloroethene	7/27/01	1000	260	ug/kg
AS-6, 23'-25'	23'-25'	1,2-Dichloroethane	7/30/01	35 U	680	ug/kg
AS-6, 23'-25'	23'-25'	Tetrachloroethene	7/30/01	14000	680	ug/kg
AS-6, 23'-25'	23'-25'	Toluene	7/30/01	41 J	680	ug/kg
AS-6, 23'-25'	23'-25'	1,1,1-Trichloroethane	7/30/01	240 J	680	ug/kg
AS-6, 23'-25'	23'-25'	Trichloroethene	7/30/01	590 J, B	680	ug/kg
AS-5, 20-22'	20'-22'	Tetrachloroethene	7/31/01	6800	220	ug/kg
AS-5, 20'-22'	20'-22'	Trichloroethene	7/31/01	430	220	ug/kg
AS-2, 23'-25'	23'-25'	Tetrachloroethene	8/01/01	5000	220	ug/kg
AS-2, 23'-25'	23'-25'	1,1,1-Trichloroethane	8/01/01	680	220	ug/kg
AS-2, 23'-25'	23'-25'	Trichloroethene	8/01/01	3000	220	ug/kg

J = Estimated result. Result is less than the reporting limit
B = Method blank contamination. The associated method blank contains the target analyte at a reportable level.
U = Results considered non-detect at concentration reported due to method blank contamination
*I = Quantitation suspect due to hydrocarbon interference.

8 TEMPORARY SOIL TREATMENT BUILDING/TREATMENT SYSTEM PIPING

8.1 TEMPORARY SOIL TREATMENT BUILDING

An 8 feet by 40 feet steel-walled portable building was selected to house the mechanical equipment for the soil treatment system including the blowers, compressors, piping, power distribution panel, control panel, and miscellaneous fittings. The soil treatment building also includes passive vents; exhaust fans, heaters, and lighting fixtures. A majority of the building's components were installed prior to delivery to the project site.

8.2 BUILDING PAD

On August 2, 2001 a pad was constructed for the temporary building using limestone base material. Approximately 6 inches of surface soil was excavated for the pad. Forty tons of limestone base material was delivered to the site on August 2, 2001 with 28 tons of material used in the construction of the temporary building pad. The remaining stone was placed on the driveway.

8.3 DELIVERY/INSTALLATION OF THE TEMPORARY SOIL TREATMENT BUILDING

The temporary soil treatment building was delivered to the site on August 9, 2001. The building was set on the limestone pad via a roll-off style tractor-trailer. After unloading, the building was checked to ensure that it sat level on the pad. A trench was excavated for electrical and telephone lines which lead from the temporary treatment building to a pre-set power pole to the north of the existing groundwater treatment building.

8.4 WELL HEAD CONSTRUCTION AND INSTALLATION OF TREATMENT SYSTEM PIPING

Construction of the wellheads, air injection hydration lines, and installation of the high density polyethylene (HDPE) welded piping began on August 13 and was completed on August 27, 2001. The wellheads were completed according to the design plans and specifications. The lines were pressure tested when all pipe had been welded and connections completed from the temporary treatment building well ports to the wellheads.

Two pressure tests were performed on August 21, 2001, one test on air injection wells and the other on air sparging wells. Both of the tests failed. Although the wellheads and fittings were installed as specified in the design plans, it was determined that the banded ends on the fittings, both at the wellheads and at the temporary treatment building were leaking and would not hold pressure.

After evaluating various solutions, an HDPE transition fitting and threaded hose barb was selected for installation at each wellhead and at the treatment building to replace the design plan-specified banded fittings. This work entailed cutting out a section of HDPE piping at each wellhead and at the treatment building, and fusion welding the new fitting to the cut piping. Replumbing began on August 22, 2001 when the replacement parts and fusion welder were received from the supplier. After completing this work the lines were pressure tested between August 22, 2001 and August 27, 2001. Results of these tests are listed in Table 13.

TABLE 13
WELLHEAD PRESSURE TEST RESULTS AND HYDRATION LINES TEST RESULTS

Line #	Date	Start Time	Stop Time	Pressure (psi)	Pass/Fail	Comments
AS-6	8/22/01	1425	1435	7.5	Pass	
AS-1	8/22/01	1645	1655	5 → 3.5	Fail	Will check all fittings and ensure they are tightened
AS-3	8/22/01	1710	1720	5	Pass	
AS-5	8/22/01	1748	1758	5	Pass	
AS-4	8/22/01	1800	1810	5	Pass	
AS-2	8/23/01	0827	0837	5	Pass	
AS-1	8/23/01	1140	1150	5	Pass	Retest, there was a loose fitting, the fitting was tightened and the well passed the pressure test
AS-16	8/23/01	1228	1238	5	Pass	
AI-1	8/23/01	1809	1819	5	Pass	
AI-2	8/23/01	1822	1832	5	Pass	
AI-14	8/24/01	1035	1045	5	Pass	
AI-15	8/24/01	1055	1105	5	Pass	
AI Hydration Lines	8/24/01	1119	1124	Water	Pass	*Air Injection wells AI-1 through AI-16* successfully pumped water to each wellheads Bentonite seal.
AI-12	8/24/01	1130	1140	5	Pass	
AI-10	8/24/01	1345	1355	5	Pass	
AI-9	8/24/01	1420	1430	5	Pass	
AI-8	8/24/01	1435	1445	5	Pass	
AI-7	8/24/01	1450	1500	5	Pass	
AI-6	8/24/01	1505	1515	5	Pass	
AI-5	8/24/01	1520	1530	5	Pass	
AI-4	8/24/01	1535	1545	5	Pass	
AI-3	8/24/01	1550	1600	5	Pass	
AI-11	8/24/01	1605	1615	5	Pass	
SVE-2	8/27/01	1030	1040	3 → 2	Pass	*Pressure started at 3 psi, then dropped* to 2 psi and held for 5 minutes at 2 psi.
SVE-3	8/27/01	1050	1100	3 → 2	Pass	Pressure started at 3 psi, then dropped to 2 psi and held for 5 minutes at 2 psi.
SVE-4	8/27/01	1105	1115	3	Pass	
SVE-7	8/27/01	1143	1153	3 → 2	Pass	Pressure started at 3 psi, then dropped to 2 psi and held for 5 minutes at 2 psi.
SVE-6	8/27/01	1158	1208	3 → 2	Pass	Pressure started at 3 psi, then dropped to 2 psi and held for 5 minutes at 2 psi.
SVE-5	8/27/01	1240	1250	3 → 2	Pass	Pressure started at 3 psi, then dropped to 2 psi and held for 5 minutes at 2 psi.
SVE-1	8/27/01	--	--	--	--	The horizontal wells were not tested.

9 PLACEMENT OF FINAL COVER

9.1 GRAVEL PLACEMENT

On August 27, 2001 154 tons of #8 pea gravel was spread over all of the well piping runs, and wellheads. Gravel "slinger" trucks and a skid steer were used to spread the gravel. The slinger method provided a uniform thickness of stone throughout the well and piping area and prevented potential damage that may have occurred through the use of conventional placement methods. The skid steer was used to place material outside the piping runs. A minimum of 4 inches of #8 pea gravel was spread although some areas received more than 4 inches to ensure good pipe support and adequate cover.

9.2 VAPOR BARRIER INSTALLATION

A one piece 20-mil, polyethylene reinforced liner, manufactured by Dura♦Skrim®, was installed as a vapor barrier on August 28, 2001. This differed from the design plan-specified use of 3 layers of 6-mil liner

The liner was placed over the pea gravel cover in accordance with the manufacturer's instructions.

9.3 PLACEMENT OF SOIL COVER

Non-impacted soil that had been previously stockpiled during the site-grading portion of the project was spread over the liner material using an excavator and skid steer. The excavator was used to move soil from the stockpile to staging areas and the skid steer placed the soils on the liner working east to west. During soil placement wellheads were marked and a spotter worked with the operator to maintain a clear distance from the wellheads. Rocks, limbs, and debris were raked and removed from the cover soils. Placement of the cover soil was completed on August 29, 2001.

9.4 SEEDING

On August 30, 2001 the site was seeded, fertilized and straw mulched. On September 13, 2001, some bare areas were re-fertilized and reseeded.

10 SOIL TREATMENT SYSTEM STARTUP/SHAKEDOWN

10.1 PHASED STARTUP

The system was started on September 9, 2001. There are three phases for the startup period.

- Phase I – Well testing/system integrity testing
- Phase II – Air injection and Soil Vapor Extraction (SVE) Systems startup
- Phase III – Air Sparge Startup and System Balance

Phase I occurred following the installation of the treatment wells and mechanical system but prior to the installation of the vapor barrier. The wells were checked under pressure or vacuum to determine if leaks or short-circuits existed in the system components that would impair the operation of the system. A specific performance criterion for testing was established prior to the initiation of testing.

Phase II was conducted following the installation of the vapor barrier. The clay-unit air injection and SVE systems were operated and evaluated to establish the initial system operating parameters. Since the potential that air emissions rates with all the system components operating could have exceeded 10 pounds per day of total VOCs, Phase II did not include the air sparge system components.

Phase III startup operations were not completed at the time of this report but will be commenced when there is reserve in the vapor emission rate to accommodate the expected additional mass loading from the air sparging system. It is undetermined at this time whether the air sparing system will require throttling to remain within the de minimus air discharge requirements.

10.2 STARTUP DATA

Operating data has been collected as specified in Section 5 of the *Air Injection/Soil Vapor Extraction/Air Sparging Design Report* (M&E, February 2001) and the *Sampling and Analysis Plan* (SHARP, 2001). The following conditions and components were monitored on a daily basis during the startup operations:

- Operation of the system and system components;
- Equipment;
- Vacuum and pressure;
- System flow rate; and
- Emissions using a PID.

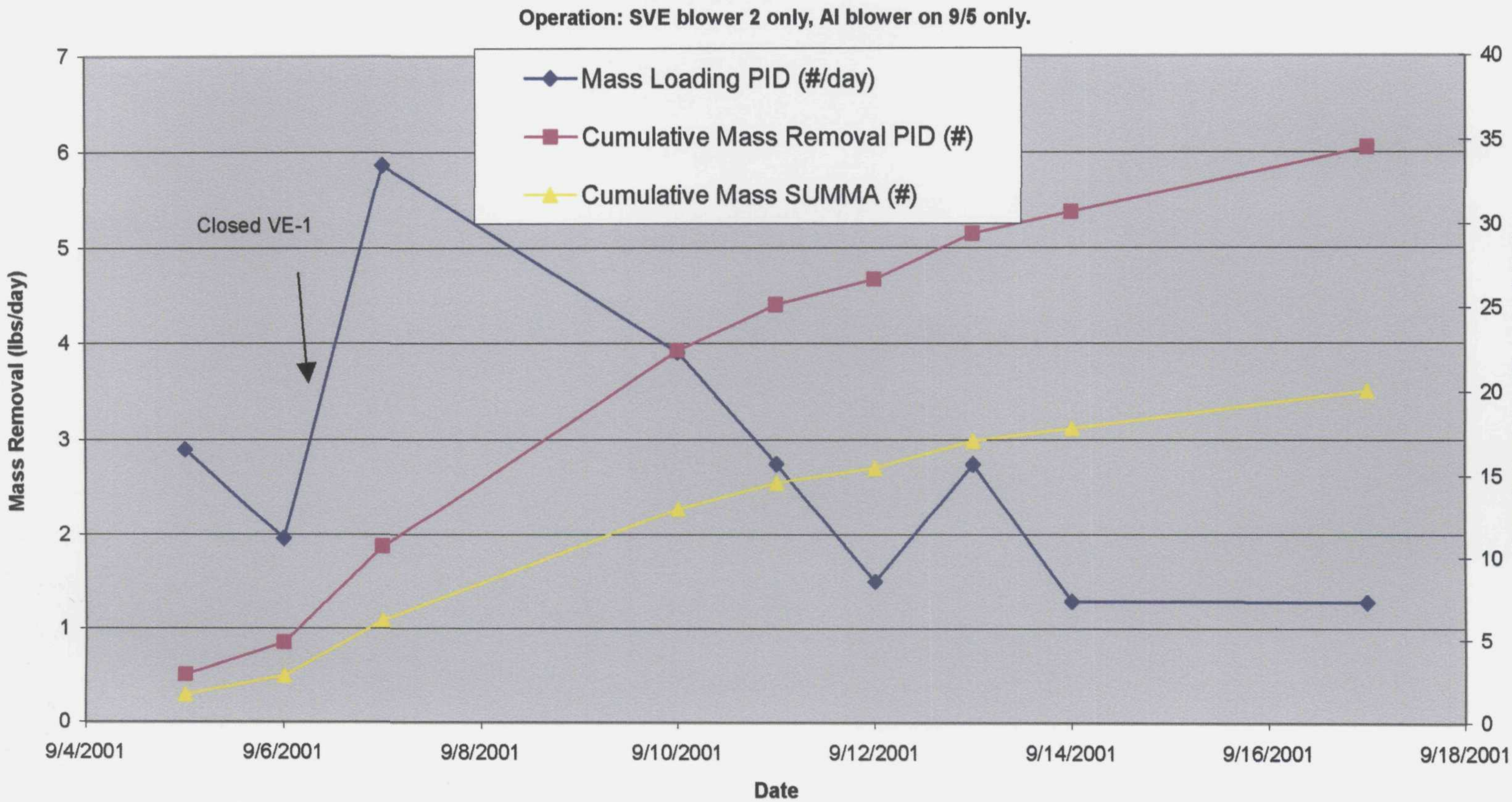
The initial PID readings collected from the SVE effluent during startup were highest in well VE-6 (117 ppmV) and ranged from 25-55 ppmV in the other SVE wells. (The horizontal SVE well, VE-1 was not turned on during the startup period. This surface well causes vacuum in the vertical wells to drop off markedly.) After the initial PID readings, the effluent concentrations began to trend downward and have stabilized between 5 and 10 ppmV. Refer to Table 14 for operational data for the air injection and soil vapor extraction system.

A Summa canister was collected on September 7, 2001 from the SVE exhaust during startup and analyzed using method TO-14/TO-15. A graph showing a comparison of mass removal calculated based on FID readings to mass removal calculated based on the Summa canister analytical results is presented as Figure 3.

TABLE 14
OPERATIONAL DATA
AIR INJECTION AND SOIL VAPOR EXTRACTION SYSTEMS

	Operational and Mass Data								
Date/ well	**9/5/01**	**9/6/01**	**9/7/01**	**9/10/01**	**9/11/01**	**9/12/01**	**9/13/01**	**9/14/01**	**9/17/01**
Inlet KO (ppmV)	31.6			36.5	14.8	11	19	1.9	9.7
Effluent Air Concentration (ppmV)	14.3	8.3	29.3	20.6	14.2	8.3	15	6.6	8.3
Effluent/Influent (%)	45%			56%	96%	75%	79%	347%	86%
Vacuum before KO ("H20)	7	7.5	21	21.8	21.7	20.8	21.4	7	11
Vacuum after filter ("H20)	19	19.8	31.5	30.3	30.2	30.1	31.2	19.5	23.5
Calculated Air Flow (ACFM)	420	411.6	401.8	392	387	402	372	372.4	356
Mass Loading (lbs/day)	2.9	1.96	5.87	3.91	2.75	1.5	2.75	1.29	1.28
Cumulative Mass Removal (lbs)	2.9	4.86	10.73	22.46	25.21	26.71	29.46	30.75	34.59

Figure 3. Granville Solvents SVE System
Estimated Mass Removal based on PID readings



11 SUMMARY OF CHANGES FROM PLANS AND SPECIFICATIONS

Certain changes to the approved design plans and specifications were necessitated by field conditions and design issues. The following changes were made to the installation:

11.1 CONTROL PANEL

The design plan-specified control panel using pilot lights and 3-position switches was replaced with a Panelview 300®. This change was part of SHARP's bid proposal.

11.2 VAPOR BARRIER

The design plans specified the use of 3 layers of a 6-mil polyethylene liner for the vapor barrier over the air injection, air sparging, and soil vapor extraction system wells and piping. A slope stability review indicated that the factor of safety against sliding was inadequate. A 20 mil reinforced polyethylene cover was used in lieu of the plan-specified cover.

11.3 AIR SPARGE BLOWER

The design plans specified the use of a positive displacement (PD) blower for the air sparge system. A review of available PD blowers indicated that excessive temperatures were likely to be generated and thus would require a chiller system. In lieu of a PD blower a rotary screw air compressor was used for the air sparge blower. This method keeps air flow temperatures within 10° above ambient.

11.4 SEPTIC TANK

During demolition of the warehouse and former employee lounge a septic tank was uncovered. This septic tank was not shown on the plans. The contents of the tank were sampled and analyzed. Analytical results required disposal at a Subtitle C landfill.

11.5 AIR INJECTION WELLS

During the drilling activities the clay layer encountered during the installation of the air injection wells was thinner in some locations than anticipated based on information from available documents. Because of the thinner clay layer some of the air injection wells were installed with shorter screens than specified in the original design. Eleven of the sixteen air injection wells were installed with screen lengths shorter than the plan-specified 5 feet. Soil samples collected during the drilling effort showed that in each of these locations, soil concentrations of contaminants of concern were below the site established risk-based cleanup goals. In the two wells that did have concentrations above the risk-based soil cleanup goals, installed screen lengths were the plan-specified 5 feet.

A review of historical soil sampling data also shows that contamination in the upper clay unit is limited. Based on the available soil data information it was determined that there was no need for the placement of additional air injection wells in this soil unit and that the overall efficacy of the SVE/AS/AI system was not compromised. This change to the plans was approved by the Granville Solvents Site Response Management Group, L.L.C. Technical Committee.

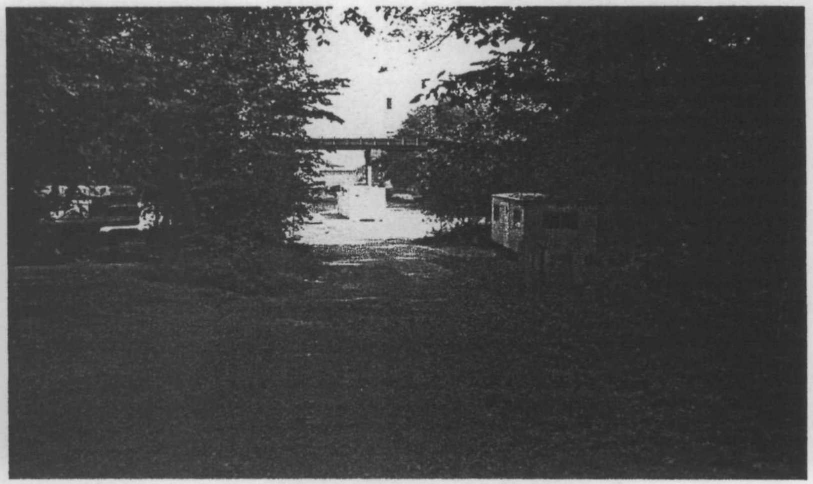
11.6 PLUMBING AND PIPING

During the installation of the treatment systems it was discovered that the plan-specified banded connections to the wellheads and manifold (within the treatment building) would not hold pressure. These banded connections were removed and replaced with HDPE fittings and hose barb connections.

A check valve was installed between the soil vapor extraction blowers to allow operation of both blower concurrently.

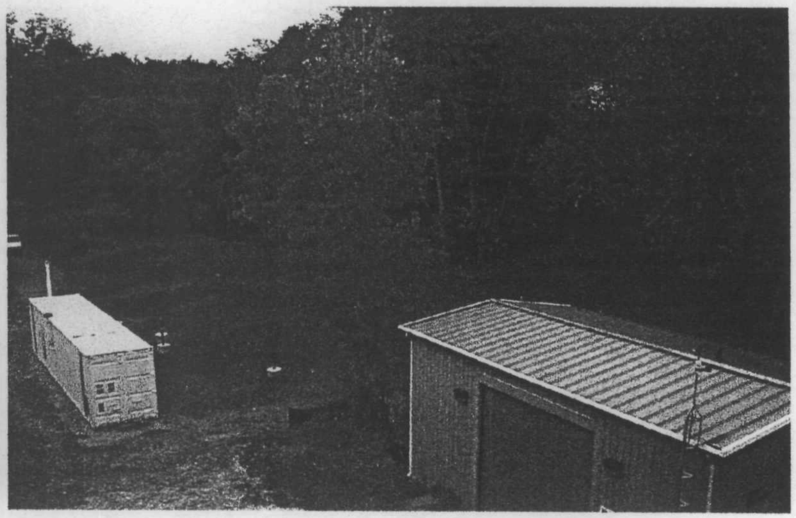
APPENDIX A
SITE PHOTOGRAPHIC LOG

View from the gate looking down the driveway

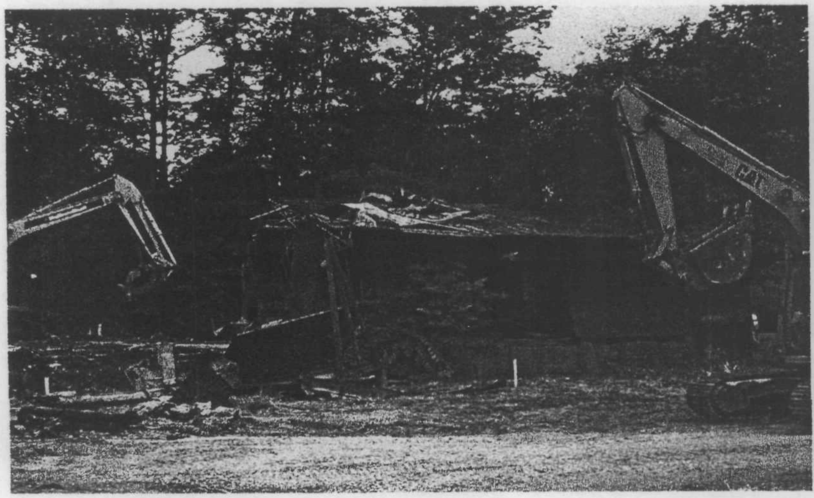


View from the gate looking down the driveway

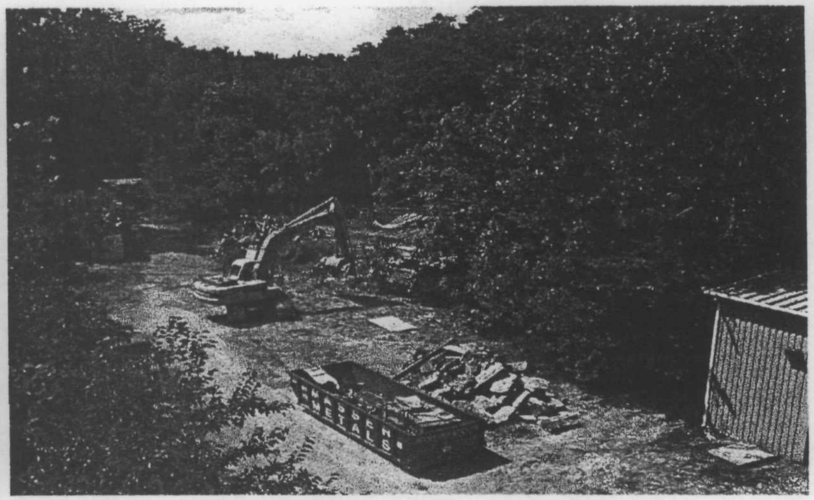
View from the overpass looking down on the site



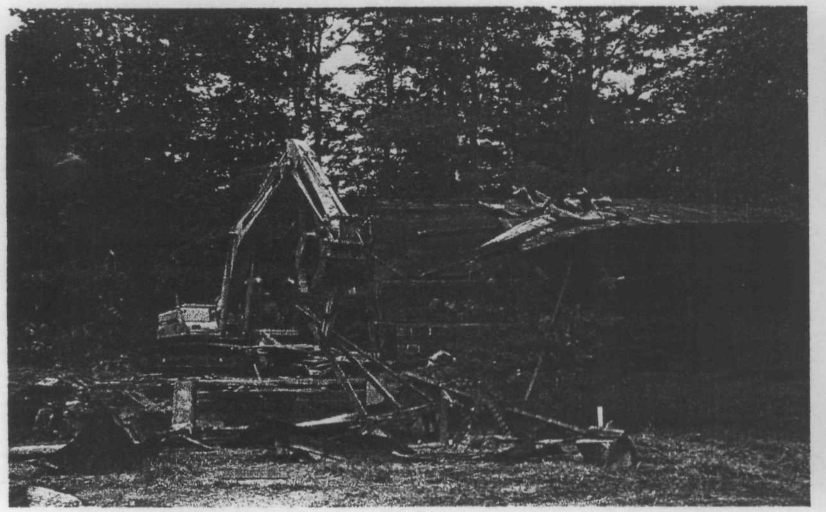
View from the overpass looking down on the site



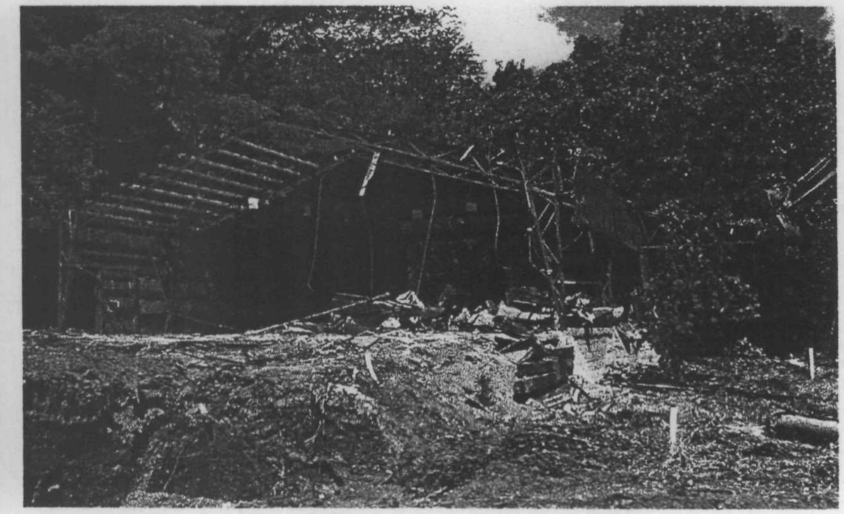
Demolition of the warehouse building



Overhead view of the site demolition activities

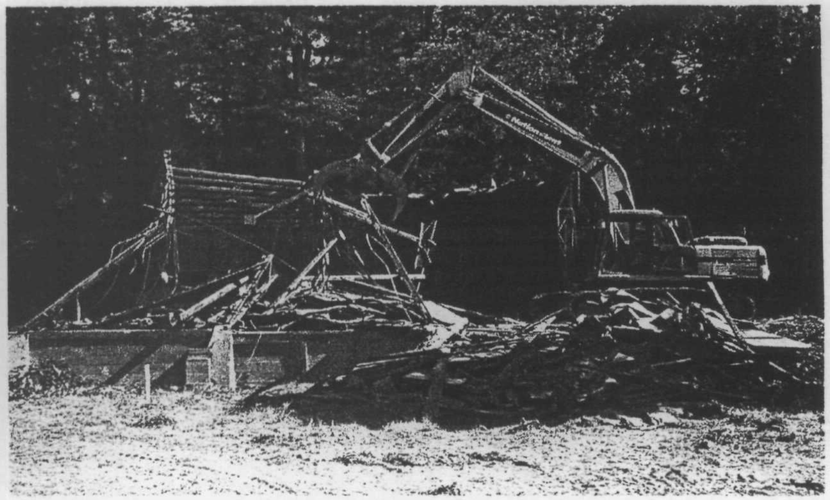


Demolition of the warehouse building



Warehouse building half way demolished. Note the metal has been removed from the roof for recycling

Photo of metal recycling roll-off, concrete, and skeletal remains of the warehouse building in background

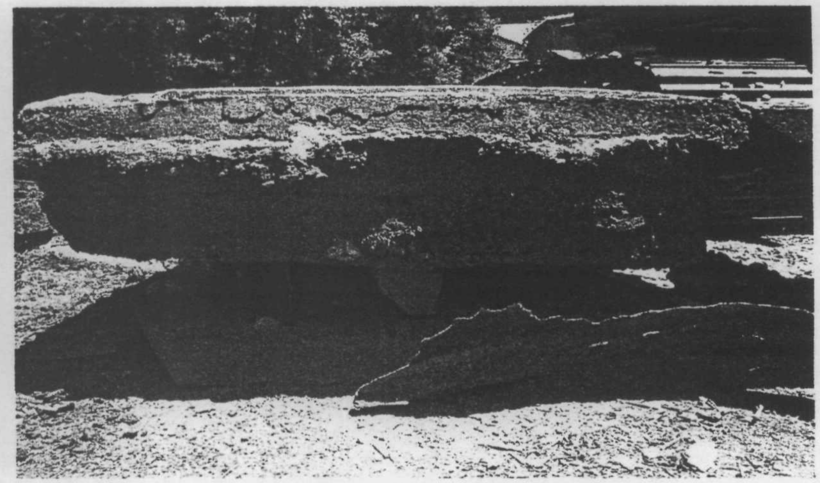


The final remnants of the warehouse building coming down

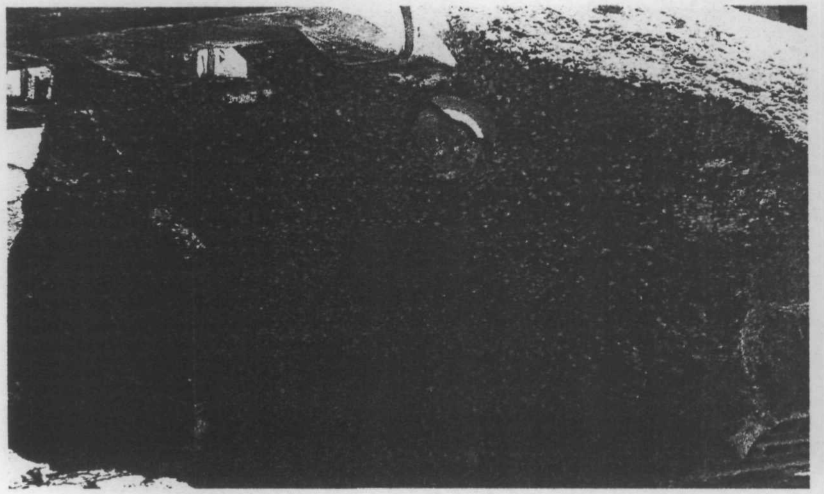
Warehouse building prior to concrete removal

First section of concrete floor in the warehouse being removed

A section of the concrete floor being removed

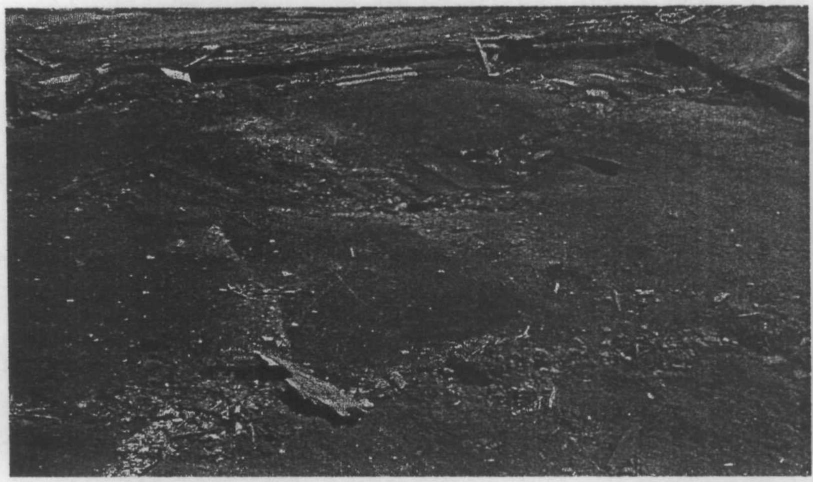


Profile view of the western catch basin, note the clay tile which was leading down into the subsurface

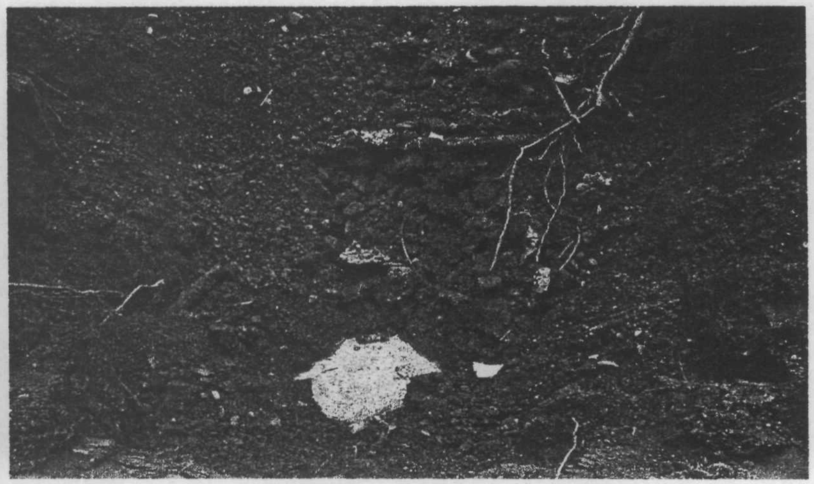


Bottom view of the western catch basin, note the concrete plug in the clay tile

Photo of where the catch basin sat, note the clay tile leading into the pea gravel bedding



View of the soil beneath the warehouse floor, near the soil boring which was placed prior to the current activities



View of the eastern catch basin hole, note the free liquids, and piping

Photo of the soil which was beneath the warehouse floor

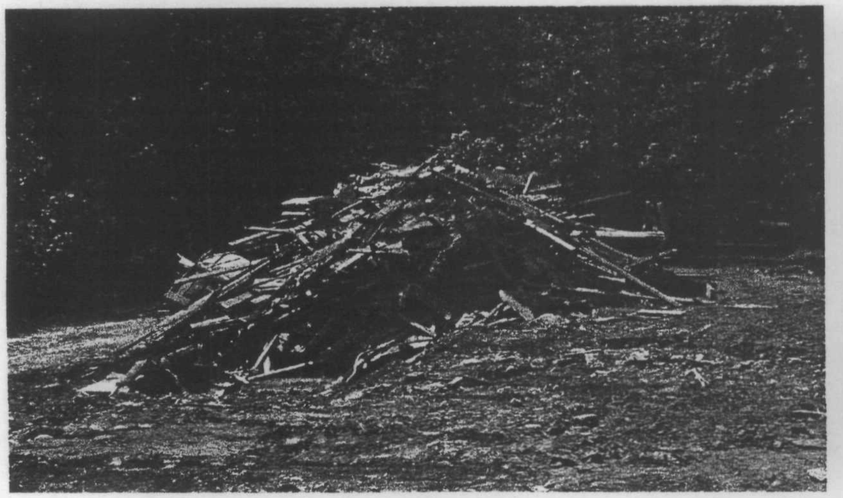
Photo of where the warehouse retaining wall stood

Site grading activities

Photo of grading activities

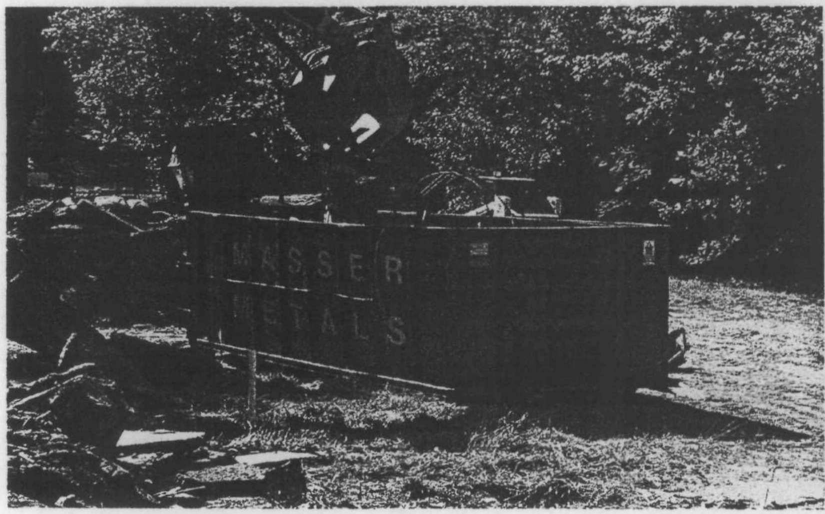
Final grade, no soil was removed in the area of the liner, the grading in this area was done to achieve a final uniform grade

Survey lay out for the AI, AS, and VE wells to be installed



Construction and demolition debris stockpile

One load remaining of C&D debris and the basement area of the former employee lounge



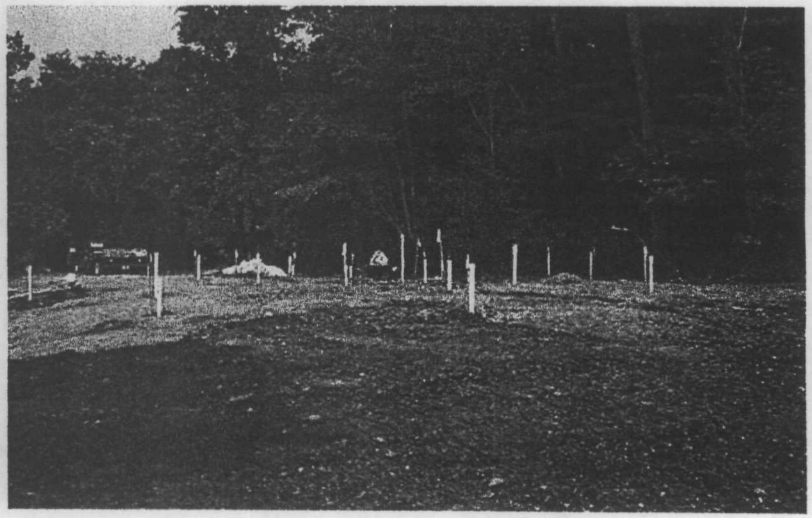
Metals being placed in the metal roll-off container

A load of metals being removed from the site for recycling

The subtitle D landfill debris stockpile (foundation materials, etc.)

Loading tractor/trailers with the subtitle D debris for disposal at Republic Services, Inc., in Amanda, Ohio

Drilling Operations



Site view of installed wells

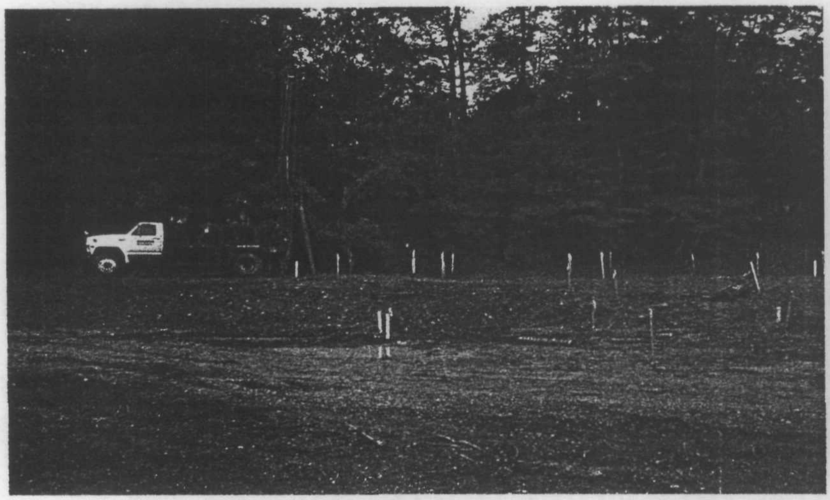
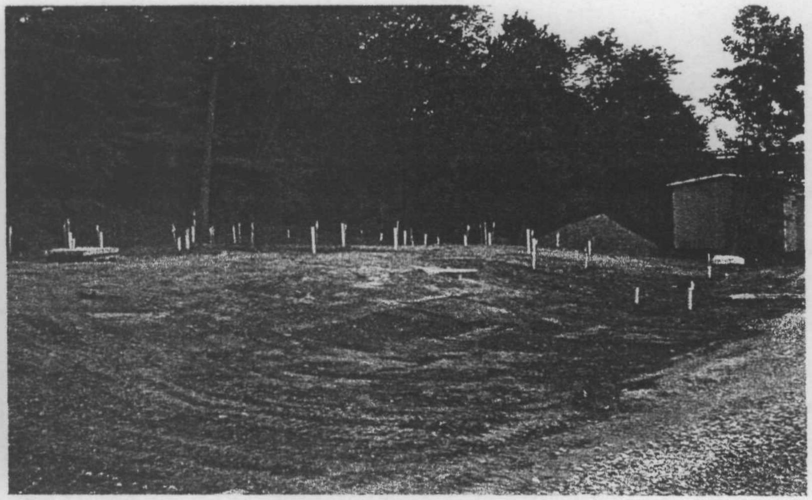
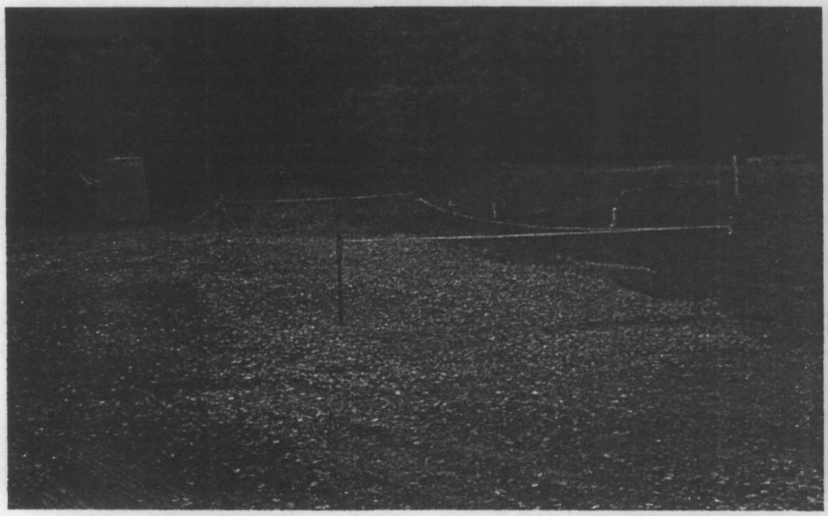


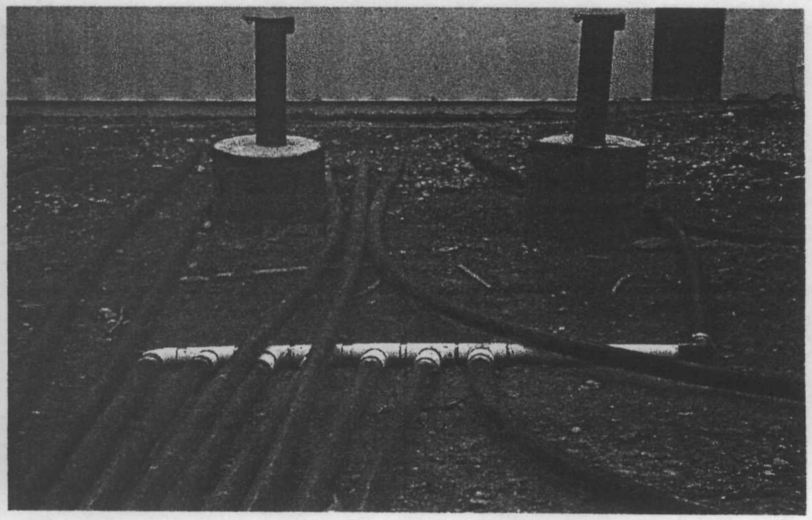
Photo of the drill rig set up on another well



Site view of al the completed wells



The temporary building enclosure pad #304 limestone



The common header of the vapor extraction wells

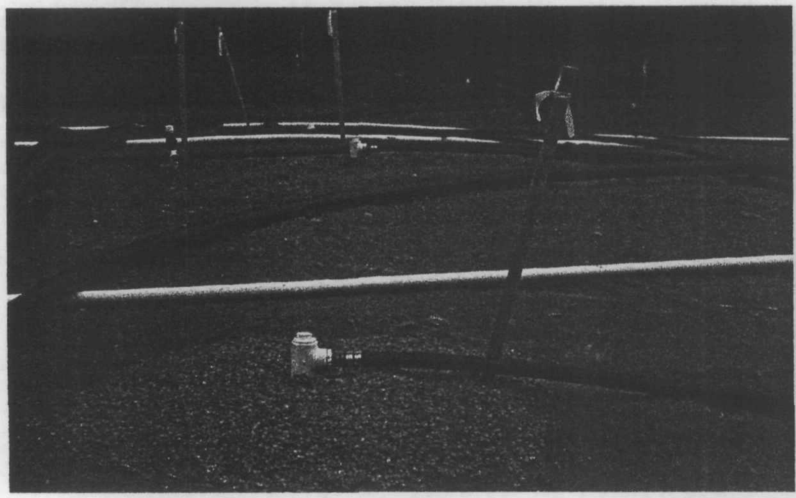
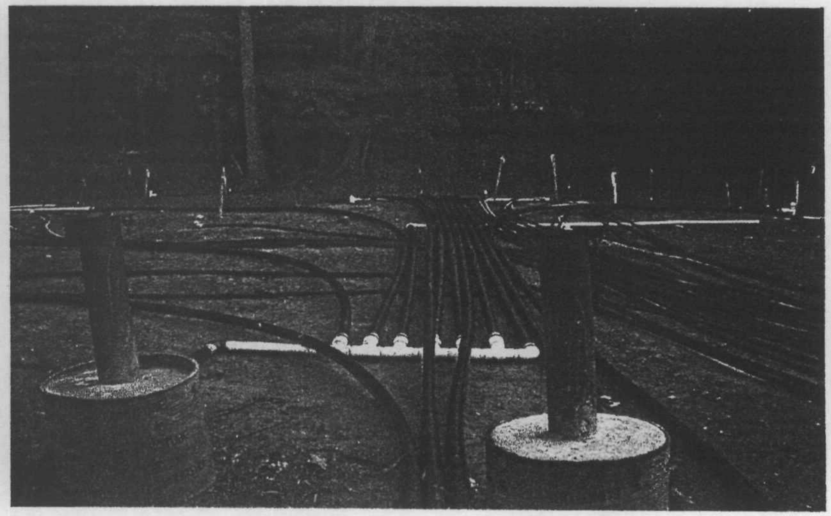


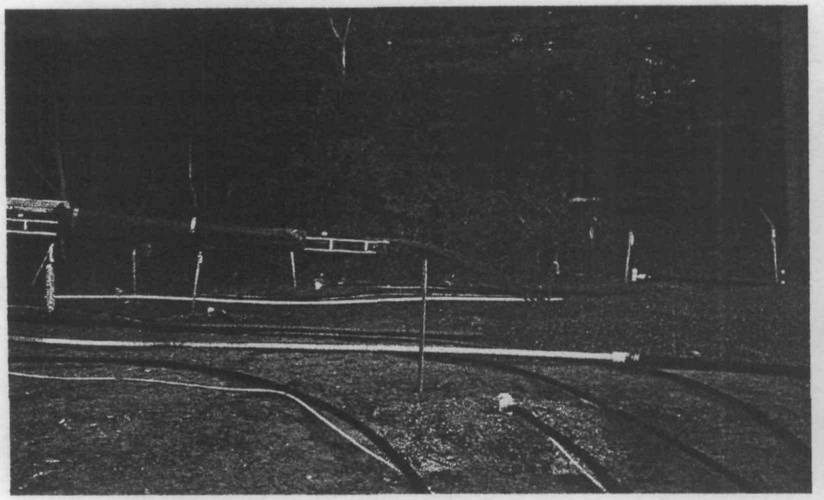
Photo of an AI well with the failed band clamps

Photo of an AI well with the HDPE welded fittings and the hydration line in place

View of the system piping

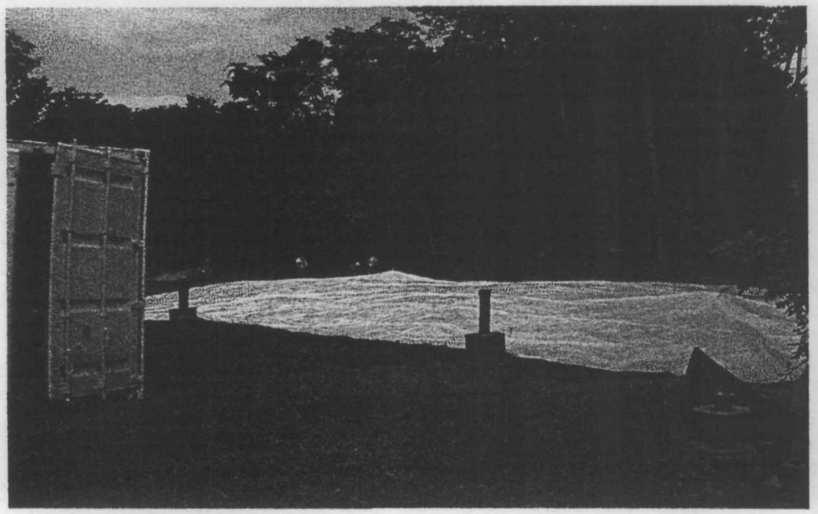


Northerly view of the system piping

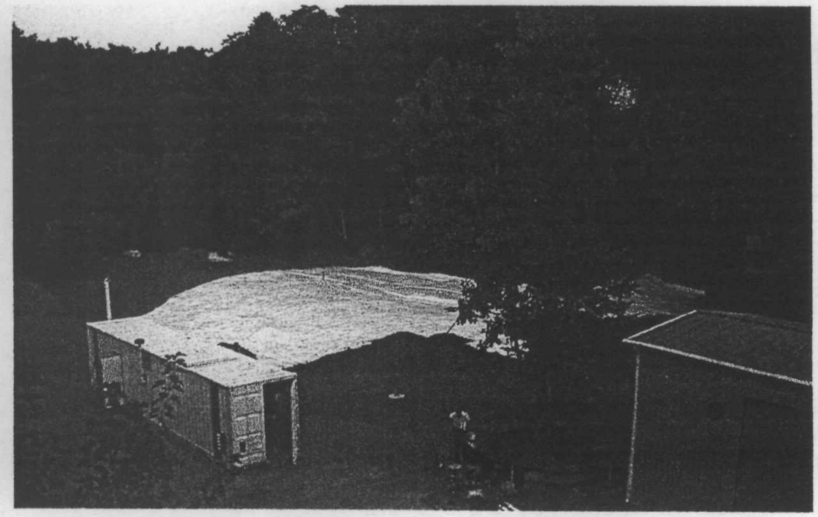


#8 pea gravel being place over the piping and wells with the slinger

Easterly view of the site with the all the pea gravel in place

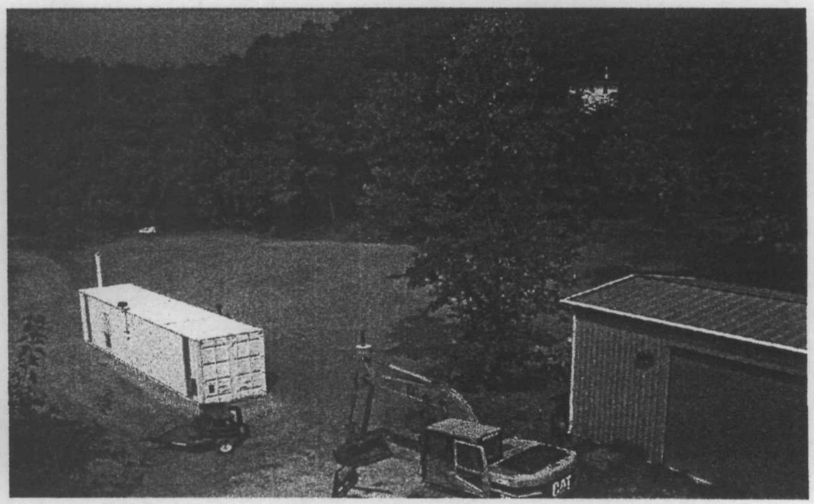


View of the liner in place



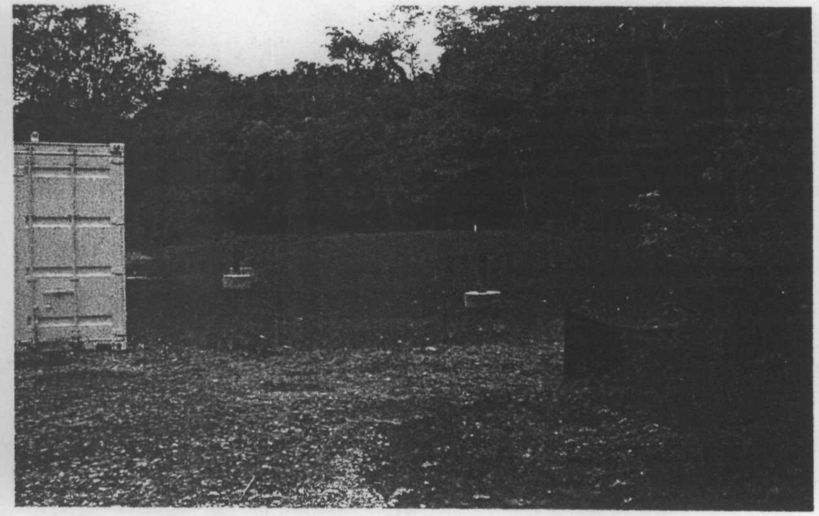
Overhead view of the liner with some soils placed on the liner

Photo of the landscape ties around the groundwater extraction well to help prevent runoff into the well, and site straw mulching



Overhead view of the site after the fertilizer, seed, and straw mulch was in place

North eastern view of the site with grass growing



Western view of the site as of 9/26/01

Bill Brewer
Granville Site Technical Committee
10805 Cahill Road
Raleigh, NC 27614

Via Express Mail

October 17, 2001

Mr. Kevin Adler, Remedial Project Manager
U S. Environmental Protection Agency, Region 5
Office of Superfund, Remedial & Enforcement Response Branch
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Subject: Granville Solvents Site Soil Removal Action – Construction Completion Report

Dear Mr. Adler:

I have enclosed two copies of the Construction Completion Report for the Soil Removal Action at the Granville Solvents Site on behalf of the Granville Solvents Site PRP Group. Copies have been sent to the following individuals:

1. Mr. Steve Acree, U.S. EPA
2. Mr. Fred Myers, Ohio EPA
3. Mr. Joe Hickman, Manager, Village of Granville

If you have any questions regarding this report, please contact me at (919) 668-3218.

Regards,

Bill Brewer

William S. Brewer, Ph.D.
Granville Technical Committee Chair

cc: Peter Felitti, Ass't Region Counsel, US EPA
Ben Pfefferle, Chairman, GSS PRP Group
Granville Technical Committee
T. Struttmann, Sharp & Associates